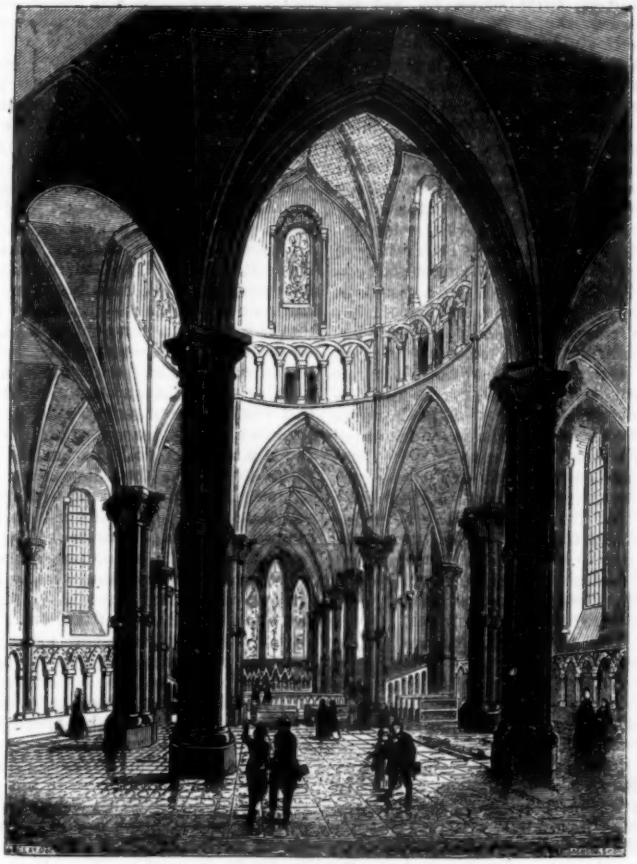

[The Temple Church, from the Entrance Doorway.]

THE TEMPLE CHURCH.

[Continued from page 127.]

A VERY deeply recessed and sumptuously enriched Norman gateway leads from the low sunken porch at the extremity of the western extremity of the building into the Round, and at once places before us the view seen above. Among the variety of objects that press upon the attention it is difficult to fix upon any one. There are the painted windows at the farthest end, appearing like some sudden discovery of one of the richest works of the olden time that we have so often read of; and the painted roof, scarcely less splendid, and from its novelty still more interesting: nearer still there are the three beautiful arches, which rather connect than divide the two portions of the structure —the very arches so mercilessly closed up and disfigured: whilst around us is the beautiful aisle with its groined roof, supported at intervals by stately dark marble pillars, that rise conspicuously from the arcade of pointed arches decorating the lower part of the wall; and, lastly, in the centre, divided from the aisle by the circle of tall clustered marble columns that support its lofty roof, is the tower, or central portion of the Round, with its series of archways opening into the gallery, or Triforium;—its clerestory, or range of windows, one of them—the gift of Mr. Willement—painted; and above, the roof, where the compartments formed by the bold groining are studded over with delicate blue ornaments on a kind of drab-like ground; the centre standing out from all the rest by its richer and more varied display of colours, surrounding a massive gilded boss. The painted window mentioned, with its deep rubies, and purples, and bronzes, represents Christ enthroned; and the general design of the decoration of the dome is borrowed from an existing ancient Sicilian church. Among the features of interest in this part of the structure are the heads which decorate the arcade in the aisle, sixty-four in number, and which were probably intended to represent on one half-circle —that to the left—a state of purgatory, and on the other of relief from it, by the mediation of the Church. But as none of the heads are original, and some of them not even copies of the original designs, it is not easy to prove the truth of this hypothesis. But we perceive, first, that in other parts of the structure—the entrance archways to the aisles of the oblong—the opposing character of the two corbel faces in each arch bears evident reference to an idea of this kind; and, secondly, the half-circle that was most carefully restored—the left or northern—presents but comparatively few exceptions to the painful character expressed by all the heads on that side, and which has been marked throughout by the nicest discrimination of the different kinds of manifestation of pain applicable to so many different classes of individuals. The philosopher looks as though he would pluck out the heart of even this mystery; the satirist or misanthrope as though he had as much contempt for pur-

gatory as all other things, even while he felt its power; on the other hand, where the individuals represented are less intellectual, and more sensual, the appropriate expressions are no less strikingly developed: here, beauty is distorted into a thing it would tremble but to see; here one can hardly avoid feeling the claws and teeth of the animal tearing the ear: whilst there is one head, combining a mingled sensation of physical and mental horror which surpasses description—it is ghastly—fearful!—it is as if all the worst passions of man's nature had been gathered together in one point and then smitten with some intolerable agony. But perhaps the most interesting of the whole is the last of this circle, a female's face—probably a mother, who forgets even the anguish of her own sufferings in the passionate, yet quiet, because hopeless, misery of reflecting on those she has left behind. Mixed with the heads we have referred to are a great variety of grotesques, and the whole are highly deserving of attention. According to Mr. Addison, the author of the recent 'History of the Knights Templars,' an arcade and cornice similarly decorated with heads have been found in the ruins of the Temple churches at Nice, and in their famous fortress near Mount Carmel, known as the "Pilgrims' Castle." We must not omit to add that the original heads, after being carelessly, because inartistically copied, were used in the builder's yard to slip beneath cart-wheels occasionally! And that is but about eighteen years ago.

The pavement of the Temple Church has attracted much attention, and deservedly. On removing the rubbish beneath the late pavement, patches of the former decorated one were found; and, accordingly, the Benchers, in pursuance of the rule that has constantly guided them, determined to restore the old encaustic tile. And as they had the old quarry at Purbeck re-opened purposely for the supply of the right material for the new pillars which it was found necessaary to have in the Round, so did they seek and obtain permission to have the flooring of the Chapter-house at Westminster Abbey taken up, to learn the exact nature of the decorations used at the period in question, and then made arrangements to have the tiles manufactured accordingly in Staffordshire. The prevailing colour is yellow or amber, forming the decorative parts, upon a dark red ground. The decorations combine a great variety of heraldic and pictorial subjects, as animals with their tails linked together, cocks and foxes, figures playing upon musical instruments; but the chief ornaments are the symbols of the two Societies of the Temple, the Lamb and the Pegasus: the former founded on the device of St. John; and the latter, it is supposed, from the interesting circumstance before mentioned concerning the founder of the Order, and the poverty which for a time prevailed among the Templars. Mr. Willement, in his 'Report to the Societies on the subject of the Decorations of the Church,' which were confided entirely to him, says, "It very probably took its rise from the earliest device of the Knights Templars, namely, the two knights on the same horse. From an imperfect impression of an imperfect seal, these two knights were by mistake converted into two wings, which the classic taste of the reign of Elizabeth might induce the Society to think a very pretty device, and the error has been, without further examination, perpetuated." A good joke in poetical guise has made these emblems noticeable; the verses here following are said to have been first chalked up on the Temple gates:—

> As by the Templars' hold you go,
> The Horse and Lamb display'd,
> In emblematic figures shew
> The merits of their trade.
>
> That clients may infer from thence
> How just is their profession—
> The Lamb sets forth their innocence,
> The Horse their expedition," &c.

But, of all the objects of interest in the Round, the recumbent figures of the Crusaders, on the floor, most eminently deserve and justify examination. These but two years ago looked generally more like rude masses of worthless stone than anything else, the surface being extensively decayed—noses, fingers, swords, legs and feet every here and there missing—all delicacy of workmanship, such as expression in the faces, or minute points of costume in the garb, apparently lost. It was found, indeed, that they were too far gone for restoration. A trial, however, was permitted to be made on one of them—the exceedingly graceful figure that is nearest to the central walk of the second pair on the right hand—and the sculptor, Mr. Richardson, set to work. The paint and whitewash, in places a quarter of an inch thick, were first removed by means of a finely-pointed tool (washes of a sufficiently powerful kind it was feared would be injurious to so decayed a surface), and the surface made clean; a chemical liquid was then forced into the stone to harden it, and, next, the restoring process begun. This consisted of two parts—filling up all the hollows (which were so numerous as to make the effigy appear like a honeycomb) with a composition exactly imitating the stone, and becoming immediately almost as hard; and, secondly, of supplying the missing limbs and members by the authority of those which remained, worked in the same material, and joined by the composition. Except in very urgent cases, the original surface, however decayed, was left untouched, and no restorations were made without absolute evidence that they *were* restorations; and yet the result is the very beautiful and noble effigies which once more grace the floor of the Temple Church in their pristine state; one only exception being made as to the coloured decorations in painting and gilding, which it was discovered by Mr. Richardson, in cleaning them, they had formerly borne, particularly those which had not been wrought in Purbeck marble: the effigy of William Marshal the younger seems to have been most rich in this respect; traces were found on it of a crimson surcoat, gilded armour, and of glass enamelling about the cushion.

Whilst upon this subject we may observe that other interesting discoveries of a similar kind were made during the recent restoration. Some of the corbel heads before referred to in the intervening archways of the aisles had *glass beads* for eyes; and only a week before the re-opening of the church a beautiful little seraph-like head was discovered at the corner of one of these archways (between the Round and the southern aisle) which had been most delicately coloured: from the traces remaining, it could be discerned that the eyes had been blue, the lips tinged with vermilion, and the cheek with a flesh-colour, and that the graceful flowing hair had been gilded. How all this reminds one of the custom of the Greeks, even in the purest eras of art among them; and of the extraordinary length to which they carried this species of decoration in works which to our eyes seem so beautiful in their naked simplicity, that they could only be impaired by such additions. With them we find metal, precious stones, or imitations of precious stones, used for the eyes of their busts and statues, as well as glass; we find them also inlaying the lips. Different-coloured marbles were used in the same work, and compositions of metal formed to harmonize in hue with the feeling intended to be expressed by the sculptor. One of the most interesting examples of the latter is that mentioned by Plutarch, a statue of Jocasta, wife of Laius, king of

Thebes, by the sculptor Silanion, in which the queen was represented dying. By an ingenious mixture of the metals of which it was formed, and, it is said, chiefly by the addition of silver, a pallid tone was produced, which greatly increased the intensity of the expression in the features. By similar means, no doubt, was produced the bronze statue of Cupid by Praxiteles, so much admired by Callistratus for its elegance of position, the arrangement of the hair, its smile, the fire in the eyes, and the vivid blush in the countenance; and the iron statue of Athamas at Delphi, mentioned by Pliny, which represented the king, sitting, after the murder of his son: this work, it appears, was not entirely of iron, for the artist Aristonidas, wishing to express the effect of confusion and remorse in the countenance of the king, used a mixture of iron and bronze, which should imitate in some measure the blush of shame.* Seeing then that we have such high authorities for the coloured decorations of statues, and that these heads in the Temple Church *were* coloured, it may almost be doubted whether the restoring process should have stopped short of this point: that is, supposing there were sufficient materials to have restored it rightly. To return: the effigies, nine in number, lie four on each side of the central walk, in a double line, the ninth being farther off on the right against the wall, in the aisle, and corresponding in position with the simply but elegantly carved stone coffin-lid in the opposite aisle. As far as it has been found possible to identify the effigies, five out of the nine are assigned as follows:—Of the first pair on the right, the farthest figure is that of the great Protector Pembroke, whose statesman-like policy freed England from the foreigners whom the revolted barons had introduced in self-defence against John, and restored at the same time to the throne of the young Henry the allegiance of hearts that had been long alienated from it; the other and nearer figure by his side is one of Pembroke's sons, William Marshal, the Younger, who overthrew Llewellyn of Wales, and was one of John's hated opponents, a supporter of the Great Charter, although John's own son-in-law, having married his daughter. Henry III. followed his funeral to the grave here, and was so affected that he could not restrain his grief from being visible to all the bystanders. Of the second pair the foremost is unknown, the other is the effigy of Gilbert Marshal, another of the Protector's sons, who died at a tournament which he had instituted, through a fall from a runaway horse. The figure still farther to the right, De Roos's, an exquisitely beautiful piece of sculpture, refers also to one of the great men of the Charter. On the left, one only of the figures has been recognised, the foremost of the two nearest the western door, which is Geoffrey de Magnaville's, a grandson of the Norman follower of William, who so distinguished himself at the battle of Hastings, and whose history was of no ordinary kind. During the civil war in the reign of Stephen, Magnaville, having deserted the cause of the latter, held the Tower for Maud, and was attacked there by the citizens, without success; but being taken prisoner at St. Albans, in 1443, was compelled to give it up with his other possessions. From that time De Magnaville seems to have grown tired of rapine and plunder on another's account (for much of the civil war at that time seems to have been little else than rapine and plunder), and to have determined to act entirely upon his own, respecting no party—treating the Church no better than the laity. One of his exploits was robbing Romsey Abbey of its consecrated vessels, among other valuables. He was killed by an arrow, which pierced his brain, as he was besieging the royal castle at Burwell, the archer's aim having been probably invited by his removing his helmet on account of the heat of the day. Of course he had been excommunicated for such deeds as that before mentioned, and in consequence no one dared to bury him in consecrated ground. The Templars, however, with whom no doubt he was connected as a kind of lay-brother and benefactor, wrapped his dead body in their habit, placed it in a leaden coffin, and then suspended it from one of the trees in their garden here. Some years after, absolution was obtained, and the body buried in the porch before the entrance doorway, and there two bodies were recently found, one of them no doubt his. Of the unknown figures, one very probably is the effigy of William Plantagenet, fifth son of Henry III., who was buried in the Temple Church. Those of the nine figures which have the legs crossed are, we need hardly mention, persons who had joined in the Crusades, or were under vows to do so. The whole form the most valuable series of examples of military costume that we possess, from the days of Stephen to those of Henry III.

[To be continued.

* See 'Penny Cyclopædia,' article SCULPTURE.

ESSAYS ON THE LIVES OF REMARKABLE PAINTERS.—No. VI.

GIOTTO AND HIS SCHOLARS.

[Continued from p. 122.]

GIOTTO'S personal character and disposition had no small part in the revolution he effected. In the union of endowments which seldom meet together in the same individual—extraordinary inventive and poetical genius, with sound, practical, energetic sense, and untiring activity and energy—Giotto resembled Rubens; and only this rare combination could have enabled him to fling off so completely all the fetters of the old style, and to have executed the amazing number of works which are with reason attributed to him. His character was as independent in other matters as in his own art. He seems to have had little reverence for received opinions about anything, and was singularly free from the superstitious enthusiasm of the times in which he lived, although he lent his powers to embodying that very superstition. Perhaps the very circumstance of his being employed in painting the interiors of churches and monasteries opened to his acute, discerning, and independent mind reflections which took away some of the respect for the mysteries they concealed. There is extant a poem of Giotto's, entitled 'A Song against Poverty,' which becomes still more *piquante* in itself, and expressive of the peculiar turn of Giotto's mind, when we remember that he had painted the Glorification of Poverty as the Bride of St. Francis, and that in those days songs in *praise* of poverty were as fashionable as devotion to St. Francis, the "Patriarch of poverty." Giotto was celebrated, too, for his joyous temper, for his witty and satirical repartees, and seems to have been as careful of his worldly goods as he was diligent in acquiring them. Boccaccio relates an anecdote of him, not very important; but as it contains several traits which are divertingly characteristic, we will give it here:—

"Fair and dear ladies!" (Thus the novelist is wont to address his auditory.) "It is a wondrous thing to see how oftentimes nature hath been pleased to hide within the most misshapen forms the most wondrous treasures of soul, which is evident in the persons of two of our fellow-citizens, of whom I shall now briefly discourse to you. Messer Forese da Rabatta, the advocate, being a personage of the most extraordinary wisdom, and learned in the law above all others, yet was in body mean and deformed, with, thereunto, a flat, currish (*ricagnato*) physiognomy; and Messer Giotto, who was

not in face or person one whit better favoured than the said Messer Forese, had a genius of that excellence, that there was nothing which nature (who is the mother of all things) could bring forth, but he with his ready pencil would so wondrously imitate it, that it seemed not only *similar*, but *the same;* thus deluding the visual sense of men, so that they deemed that what was only pictured before them did in reality exist. And seeing that through Giotto that art was restored to light which had been for many centuries buried (through fault of those who, in painting, addressed themselves to please the eye of the vulgar, and not to content the understanding of the wise), I esteem him worthy to be placed among those who have made famous and glorious this our city of Florence. Nevertheless, though so great a man in his art, he was but little in person, and, as I have said, ill-favoured enough. Now it happened that Messer Forese and Giotto had possessions in land in Mugello, which is on the road leading from Florence to Bologna, and thither they rode one day on their respective affairs, Messer Forese being mounted on a sorry hired jade, and the other in no better case. It was summer, and the rain came on suddenly and furiously, and they hastened to take shelter in the house of a peasant thereabouts who was known to them; but the storm still prevailing, they, considering that they must of necessity return to Florence the same day, borrowed from the peasant two old, worn-out pilgrim-cloaks and two rusty old hats, and so they set forth. They had not proceeded very far when they found themselves wet through with the rain, and all bespattered with the mud; but after a while, the weather clearing in some small degree, they took heart, and from being silent they began to discourse of various matters. Messer Forese having listened awhile to Giotto, who was in truth a man most eloquent and lively in speech, could not help casting on him a glance as he rode alongside, and considering him from head to foot thus wet, ragged, and splashed all over, and thus mounted and accoutred, and not taking his own appearance into account, he laughed aloud. 'O Giotto,' said he, jeeringly, 'if a stranger were now to meet us, could he, looking on you, believe it possible that you were the greatest painter in the whole world?' 'Certainly,' quoth Giotto, with a side glance at his companion, 'certainly; if looking upon your worship he could believe it possible that you knew your A B C!' Whereupon Messer Forese could not but confess that he had been paid in his own coin."

This is one of many humorous repartees which tradition has preserved, and an instance of that readiness of wit—that *prontezza*—for which Giotto was admired; in fact he seems to have presented in himself, in the union of depth and liveliness, of poetical fancy and worldly sense, of independent spirit and polished suavity, an epitome of the national character of the Florentines, such as Sismondi has drawn it. We learn, from the hyperboles used by Boccaccio, the sort of rapturous surprise which Giotto's imitation of life caused in his imaginative contemporaries, and which assuredly they would be far from exciting now; and the unceremonious description of his person becomes more amusing when we recollect that Boccaccio must have lived in personal intercourse with the painter, as did Petrarch and Dante. When Giotto died in 1336, his friend Dante had been dead three years; Petrarch was thirty-two, and Boccaccio twenty-three years of age. When Petrarch died in 1374, he left to his friend, Francesco da Carrara, Lord of Padua, a Madonna, painted by Giotto, as a most precious legacy, "a wonderful piece of work, of which the ignorant might overlook the beauties, but which the learned must regard with amazement." All writers who treat of the ancient glories of Florence—Florence the beautiful—Florence the free—from Villani down to Sismondi, count Giotto in the roll of her greatest men. Antiquaries and connoisseurs in art search out and study the relics which remain to us, and recognise in them the dawn of that splendour which reached its zenith in the beginning of the sixteenth century: while to the philosophic observer Giotto appears as one of those few heaven-endowed beings, whose development springs from a source within—one of those unconscious instruments in the hand of Providence, who, in seeking their own profit and delight through the expansion of their own faculties, make unawares a step forward in human culture, lend a new impulse to human aspirations, and, like the "bright morning star, day's harbinger," may be merged in the succeeding radiance, but never forgotten.

Before we pass on to the scholars and imitators of Giotto, who during the next century filled all Italy with schools of art—we may here make mention of one or two of his contemporaries, not so much for any performances left behind them, but because they have been commemorated by men more celebrated than themselves, and survive embalmed in their works as "flies in amber." Dante has mentioned, in his 'Purgatorio,' two painters of the time, famous for their miniature illustrations of Missals and MSS. Before the invention of printing, and indeed for some time after, this was an important branch of art: it flourished from the days of Charlemagne to those of Charles V., and was a source of honour as well as riches to the laymen who practised it. Many, however, of the most beautiful specimens of illuminated manuscripts are the work of the Benedictine monks, who laboured in the silence and seclusion of their convents, and who yielded to their community most of the honour and all the profit: this was not the case with Oderigi, whom Dante has represented as expiating in purgatory his excessive vanity as a painter, and humbly giving the palm to another, Franco Bolognese, of whom there remains no relic but a Madonna, engraved in Rosini's 'Storia della Pittura.' He retains, however, a name as the founder of the early Bolognese school. The fame of Buffalmacco as a jovial companion, and the tales told in Boccaccio of his many inventions and the tricks he played on his brother-painter the simple Calandrino, have survived almost every relic of his pencil. Yet he appears to have been a good painter of that time, and to have imitated, in his later works, the graceful simplicity of Giotto:* he had also much honour and sufficient employment, but having been more intent on spending than earning, he died miserably poor in 1340.

Cavallini studied under Giotto at Rome, but seems never to have wholly laid aside the Greekish style in which he had been first educated. He was a man of extreme simplicity and sanctity of mind and manners, and felt some scruples in condemning as an artist the Madonnas before which he had knelt in prayer: this feeling of earnest piety he communicated to all his works. There is by him a picture of the Annunciation preserved in the church of St. Mark at Florence, in which the expression of piety and modesty in the Virgin, and of reverence in the kneeling angel, is perfectly beautiful: the same devout feeling enabled him to rise to the sublime in a grand picture of the Crucifixion which he painted in the church of Assisi, and which is reckoned one of the most important monuments of the Giotto school—the resignation of the divine sufferer,

* An elegant little figure of St. Catherine, attributed to Buffalmacco, is engraved in Rosini, p. 52. A picture of St. Ursula, an early work of the same painter, is quite Byzantine in style. The Frescoes in the Campo Santo at Pisa, so long attributed to him, are by another hand. (See Kugler and Rumohr.)

the lamenting angels, the fainting Virgin, the groups of Roman soldiers, are all painted with a truth and feeling quite wonderful for the time. Engravings after Cavallini may be found in Ottley's 'Early Italian School,' and in Rosini (p. 21). He became the pupil of Giotto when nearly forty years old, and survived him only a short time, dying in 1340. With Cavallini begins the list of painters of the Roman school, afterwards so illustrious. Among the contemporaries of Giotto we must refer once more to Duccio of Sienna. Though an established painter in his native city when Giotto was a child, his later works show that the influence of that young and daring spirit had given a new impulse to his mind. His best picture, still preserved, and described with enthusiasm in Kugler's 'Handbook,' was painted in 1311. Duccio died very old, about 1339.

ECONOMICAL USES OF THE MAPLE.

Among the trees which abound in the magnificent forests of North America the Maple deserves notice on account of the large variety of uses to which it is applied in the arts of life.

There are about fourteen species of this tree worthy of enumeration of which one half are European and the other half American. The Maples, in general, are lofty and beautiful trees. Capable of enduring an intense degree of cold, they form, in northern countries extensive forests, which seem to occupy a medium place between those of the Beech, the Spruce, the Larch, and the Fir, on one side, and those of the Chestnut and the Oak on the other. In America the Maple is found principally between the latitudes of 43° and 46°. As we do not propose to enter upon the botanical characters of the different species, it will not be necessary to classify them in any particular order; but it will suffice to take the useful applications, one by one, and enumerate the species which yield them. We will begin with the Maple in respect of the wood or timber which it yields; taking as our principal guides Michaux ('Arbres Forestières de l'Amerique Septentrionale') and Loudon ('Arboretum et Fruticetum Britannicum").

The Sugar-Maple, whose name is derived from a circumstance which we shall notice further on, is one of the finest of this genus. In America it sometimes reaches a height of seventy or eighty feet, and is a very noble-looking tree. It has been estimated that in the northern parts of the states of Pennsylvania and New York there are ten millions of acres which produce these trees, in the proportion of about thirty to an acre.

In the more Southern states it is nearly unknown. The wood, when cut, is white: but after being wrought and exposed some time to the light, it takes a rosy tinge. Its grain is fine and close, and when polished it has a silky lustre. In the States of Vermont, New Hampshire, and Maine, where the oak is not plentiful, the timber of the sugar-maple is substituted for it, in preference to that of the beech, the birch, and the elm. When perfectly seasoned, which requires a period of two or three years, it is used by wheelwrights for axletrees and spokes and similar purposes. It is also employed in the manufacture of Windsor chairs. In the country, where the houses are wholly of wood, this kind of timber is used for the framework; and in the district of Maine it is preferred to beech for the keels of vessels, as it furnishes longer pieces. Used in combination with beech and yellow pine, it forms the lower frame of ships, immersed in the water.

The Red-flowering or Scarlet Maple is another American species, known in different parts of the United States by the various names of Swamp Maple, Soft Maple, and the two others just mentioned. It is found very extensively from Canada in the north to Florida in the south, located generally in swamps or on the borders of creeks. There are in Philadelphia and New Jersey extensive marshes called "Maple Swamps," exclusively covered with it; the trees rising to a height of seventy or eighty feet, and measuring three or four feet in diameter. It has been observed that in descending towards the mouths of the large American rivers, the red-maple is the last tree found in the swamps, the tree diminishing in size as the soil becomes impregnated with salt. The wood of this tree is applied to various uses in America. It has a fine and close grain, is easily wrought in the lathe, and acquires by polishing a glossy and silken surface. It is very largely used in the manufacture of Windsor chairs. The pieces are prepared in the country; and so considerable is the demand, that boats laden with them frequently arrive at New York and Philadelphia, where extensive factories are carried on, the manufactured articles being furnished to the neighbouring towns, and also exported to the West Indies. The whole framework of japanned chairs in America is made of this wood, the backs being made of hickory. The frame, the nave, and the spokes of spinning-wheels are made of the red maple. At Philadelphia it is the only wood used for saddle-trees; and in the country it is preferred to most others for yokes, shovels, and wooden dishes, which are brought to market by the country-people, and purchased by the dealers in wooden-ware. Before mahogany became generally fashionable in the United States, the best furniture in use was made of the red maple; and bedsteads are still made of it, which are said to equal the finest mahogany in richness and lustre. It sometimes happens that in very old trees of this species the grain, instead of following a perpendicular direction, is undulated, whence it obtains the name of "curled maple;" and from the toughness and strength which this texture superadds to the natural lightness and elegance of

the wood, such specimens are much sought after for making the stocks of fowling-pieces and rifles.

The White Maple, like the Red, is an American species. It is found on the banks of all the rivers which flow from the mountains of the interior to the ocean; and is particularly abundant in the Western states, about the Ohio and its tributary streams. "There," says Michaux, "sometimes alone, and sometimes mingled with the willow, which is found along all these waters, it contributes singularly by its magnificent foliage to the embellishment of the scene. The brilliant white of the leaves beneath forms a striking contrast with the bright green above, and the alternate reflections of the two surfaces in the water heightens the beauty of this wonderful moving mirror, and aids in forming an enchanting picture, which, during my long excursions in a canoe in these regions of solitude and silence, I contemplated with unwearied admiration." Unlike the Red Maple, the White species is found on the banks of such rivers only as have limpid waters and a gravelly bed, and never in swampy ground. The wood of this species is very white and of a fine grain; but it is softer and lighter than that of the other species. Wooden bowls are sometimes made of it; and cabinet-makers frequently employ it in their operations.

The Sycamore Maple, or Great Maple, is a species which grows abundantly in various parts of Europe, such as Switzerland, Germany, and Italy. Its timber, when the tree is young, is white; but as it grows older the tint changes to yellow or even brown. It is compact and firm, without being very hard; of a fine grain, sometimes veined; susceptible of a high polish; and easily worked either at the bench or the lathe. In France and Germany this wood is much sought after by wheelwrights, cabinet-makers, turners, sculptors in wood, manufacturers of musical-instruments—especially of violins, and makers of toys and other small wares. It is also used for pestles, tables, rollers, spoons, plates, and a considerable variety of household articles; as likewise for gun-stocks. The wood of the British trees belonging to this species is used by our manufacturers for many of the purposes here enumerated, as well as for cider-presses. The Scotch wooden dishes and spoons, so much used in bygone times, were frequently made of this wood.

The Rose-leaved Maple, a native of the Jura Alps and the Pyrenees, yields a very hard and compact kind of wood, free from sap-wood, not easily split, and so homogeneous in its texture, that it is almost impossible to distinguish the annual layers: it is white lightly shaded with lemon-colour, sometimes exhibiting flashes or shades of red, and it takes a fine polish. This wood is much used by wheelwrights in France.

There are other species whose wood is more or less employed in the arts, but which may be dismissed in a few words; such as the round-leaved maple, a native species of North America, of which the fine, white, tough, and close-grained wood is much used by the Americans, and of which the slender branches are employed by the native Indians to make the hoops of their scoop-nets, used for taking salmon at the rapids and in the contracted parts of rivers; the Montpelier maple, found in southern France, Spain, and Italy, the hard and heavy wood of which is used in France by turners and cabinet-makers; and the common or field maple, found in various parts of Europe and Asia, and the wood of which is used for similar purposes as that of the species just named.

But besides the applications of maple-wood for purposes of strength and service, there are features presented by several of the species which admirably qualify them for use as ornamental or 'fancy' woods, either in the bulk or more frequently in the form of a thin veneer laid on a foundation of less valuable wood. We have before alluded to an undulating arrangement which is sometimes observable in old trees of the red maple species, and of the strength which this structure gives to the wood. It is said that not more than one tree in a hundred of the species presents these peculiarities; but, when they do occur, the specimens are much prized for the ornamental character of the wood. The serpentine direction of the fibre, which renders the wood difficult to split and to work, produces, in the hands of a skilful mechanic, the most beautiful effects of light and shade. These effects are rendered more striking if, after smoothing the surface of the wood with a double-ironed plane, it is rubbed with a little sulphuric acid, and afterwards with linseed oil. On examining it attentively, the varying shades are found to be owing to the irregular reflection of light, and are more sensibly perceived if the surface be viewed in different directions by candlelight.

The sugar-maple, in like manner, yields wood which is highly valued for purposes of ornament. This wood exhibits two accidental forms in the arrangement of the fibre: of which the first consists in undulations like those in the curled wood of the red maple; while the second arrangement, found only in old trees that are still sound, and which appears to arise from an inflexion of the fibre from the circumference towards the centre, produces minute spots, sometimes contiguous and at other times wide apart. The more numerous the spots, the more beautiful and the more esteemed is the wood. This variety is known to our cabinet-makers by the name of 'bird's-eye maple,' and is much used for inlaying and veneering. The finest effect is produced when the logs are cut with the saw parallel to the concentric circles of the wood.

Nearly all the kinds of maple-wood possess sufficient beauty to be used as veneers, but the two preceding are the most prized. Specimens of the large-leaved maple have, indeed, been seen, of which the wood exhibited a grain scarcely inferior in beauty to the finest satin-wood. Many kinds exhibit knots, spots, and curls, which cause them to be used in bulk or solid pieces for ornamental purposes. For instance, the root of the sycamore-maple often exhibits a veined texture which leads to its employment in curious articles of cabinet-work: the roots, too, of the Italian or Opal maple, especially of those trees which have been often cut, are very much sought after on account of their hardness, and their curious knots and blotches, which render them suitable for making snuff-boxes and similar articles; and lastly, the roots of the common or field maple are similarly sought for and employed.

In a country like England, where coal forms the great bulk of the fuel employed—not only for domestic use, but also in manufactures—the relative qualities of different woods as fuel, and as materials for charcoal, are not so much attended to as in most other countries; and consequently we find, in descriptions of foreign trees written by foreigners, that the value of any particular tree as fuel is generally entered among its qualities. Such is the case with respect to the maple. A few examples will suffice. The charcoal obtained from the sugar-maple is said to be preferred, in the forges of Vermont and Maine, to that obtained from any other kind of wood: the trees of this species in the States just named yield from their wood charcoal one-fifth heavier than that from similar trees grown farther south—a fact which shows the effect of climate. The wood of the Sycamore-maple is highly prized as fuel, both for the quantity of heat which it gives out, and the time that it continues burning: in the state both of wood and of charcoal, it is superior to beech as a fuel. Michaux says that the hatters of Pittsburg prefer the charcoal of the white maple wood to that of any other for heating their

boilers, under the impression that it affords a more uniform and durable heat. The wood of the common maple, whether in its natural state or as a charcoal, makes excellent fuel; whereas that of the red species has a bad reputation in America in respect to its burning qualities.

The leaves and young shoots of the maple are often brought more or less into use. Thus, Pallas informs us, while treating of the Tartarian maple, that the Calmucks boil the fruit in water, and afterwards use it for food, mixed up with milk and butter. An American species, called the striped-bark maple, affords food to cattle in Nova Scotia, where the animals eat the leaves both in the green and dried state; and in spring, when the buds begin to swell, both horses and cattle are turned into woods to browse on the young shoots.

With respect to the manufacturing arts, the maple has hitherto chiefly been valuable in relation to the solid wood which constitutes the trunk; but it is not improbable that various useful applications will hereafter be made of the sap or juice. The cellular matter of the inner bark of the red maple, which is of a dusky red colour, yields by boiling a purplish colour, which becomes very dark blue on the addition of sulphate of iron; and this colour, mixed with a certain portion of alum in solution, is used in the provincial districts of America for dyeing black. The cellular integument of the white maple yields in a similar manner a black-dyeing material. The preparation of potash from the ashes of the sugar-maple is carried on most extensively in America, particularly in Upper Canada, in a manner which has been fully described by an eye-witness in our No. 573.

In a domestic point of view, the extraction of sugar from the juice of the maple is by far the most important application of the tree. From the sap of the Norway maple, sugar is prepared in Norway, Sweden, and Lithuania; thirty-five quarts of sap have been produced from one tree in eight days. The sycamore maple has been known to yield thirty-six quarts in five days, which gave about an ounce of sugar to a quart of sap; and in an experiment made by Sir T. D. Lauder on a tree of this kind in 1816, 116 parts of juice or sap yielded one of sugar. Most of the other species yield saccharine sap more or less freely; but all are exceeded in this respect by the sugar-maple, which has derived its name from the abundance of this sap found in it and which is a tree of great importance to Canadian emigrants. The whole circumstances attending the collection of the sap and the manufacture of the sugar from it, have been so fully detailed in our Nos. 194 and 300, as to preclude the necessity for any further description here.

SONOROUS GRANITE AND SAND-HILLS.

In the tropical regions of both continents there are certain phenomena which have given rise to much speculation, both among superstitious natives, and among European men of science who have visited the districts in question. Masses of granite rock, both hewn and unhewn, and hills of loose sand, have been heard to emit sounds, either at certain hours of the day, or else when agitated or disturbed under peculiar circumstances. The attention of scientific men had been directed to the matter some years back; but very recently the late lamented Sir Alexander Burnes met with a similar sonorous hill in Afghanistan.

The statue of Memnon, still existing in a mutilated state, in Egypt, was celebrated among the ancients for the vocal sounds—or sounds so deemed—emitted by it. One of the classical writers states that the statue looked towards the east, and that it spoke as soon as the rays of the rising sun fell upon its mouth; another mentions it as emitting only a single sound; a third alluded to several different tones or sounds; and a fourth states that the statue, which is dedicated to the sun, "emits sounds every morning at sunrise, which can be compared only to that of the breaking of the string of a lyre." When such men as Pausanias, Strabo, and Juvenal mention these emissions of sound, it is pretty certain that there must have been some foundation for the report; but in the absence of any natural explanation of the causes, mystery soon enveloped the whole. The simple sounds emitted were by degrees magnified into intelligible words, and even into an oracle of seven verses; and the Egyptian priests appear to have made use of this agency to maintain an ascendency over the people.

When modern travellers became acquainted with this statue, much discussion arose as to whether the sounds really heard were due to any natural cause, or were produced by some contrivance of the priests. M. Dussaulx offers an opinion that, "the statue being hollow, the rays of the sun heated the air which it contained; and this air, issuing at some crevice, produced sounds to which the priests gave their own interpretation." This probably approaches pretty nearly to the truth; but other writers, preoccupied with the idea that the whole was an artificial arrangement, have set themselves the task of deciding how such an effect might be produced. M. Langles conceives that the sounds might be produced by a series of hammers, which struck either the granite itself, or sonorous stones, like those which have long been used in China for musical-instruments. M. Salverte goes much farther than this. He supposed that there might be adapted to these hammers a *clepsydra*, or water-clock, or some other instrument, fitted to measure time, and so constructed as to put the hammers in motion at sunrise. He even tries to show how the hammers themselves might be made to act, by the following conjecture:—Between the lips of the statue, or in some less remarkable part of it, concealed from view, he supposed an aperture to be made, containing a lens or a mirror capable of focalizing the rays of the rising sun upon one or more metallic levers, which by their expansion put in motion the series of hammers.

Besides the large amount of improbability attached to the construction of such a complex piece of scientific apparatus in such remote times, and the absence of any evidence, either written or monumental, in support of it—there is this obstacle, that the position of the apparatus, which might be effective at one part of the year, could not be so at another, on account of the different parts of the horizon at which the sun rises being farther north in summer than in autumn, and in autumn than in winter. It is also plain that the mutilation of the statue must have destroyed the apparatus; and yet the sound is still heard. Sir A. Smith, in the year 1821, examined the statue, and states that at six o'clock in the morning he distinctly heard sounds emitted; but he thinks they emanate from the pedestal, and not from the statue.

Sir David Brewster, in his 'Letters on Natural Magic,' groups certain items of information which seem to point to the true explanation of the cause of these sounds. Baron Humboldt in Colombia, and MM. Jamard, Jollois, and Devilliers in Upper Egypt, happened about the same time to meet with masses of granite from which sounds were heard. Humboldt thus speaks:—"The granitic rock on which we lay is one of those where travellers on the Orinoco have heard from time to time, towards sunrise, subterraneous sounds resembling those of the organ. The missionaries call these stones *loxas de musica*. 'It is witchcraft,' said our young Indian pilot. We never ourselves heard these

mysterious sounds, either at Carichana, Vieja, or in the Upper Orinoco; but from information given us by witnesses worthy of belief, the existence of a phenomenon that seems to depend on a certain state of the atmosphere cannot be denied. The shelves of rocks are full of very narrow and deep crevices; they are heated during the day to about 50°; and I often found their temperature at the surface during the night at 39°, the surrounding atmosphere being at 28°. It may easily be conceived that the difference of temperature between the subterraneous and the external air attains its maximum about sunrise. May not these sounds of an organ, then, which are heard when a person sleeps upon the rock, his ear in contact with stone, be the effect of a current of air that issues out through the crevices? Does not the impulse of the air against the elastic spangles of mica that intercept the crevices contribute to modify the sounds? May we not admit that the ancient inhabitants of Egypt, in passing incessantly up and down the Nile, had made the same observation on some rocks of the Thebaid, and that the music of the rocks there led to the jugglery of the priests in the statue of Memnon?"

The last suppositive case put by Humboldt received singular support at the very time, but without the mutual knowledge of the parties, by the French travellers in Egypt. These gentlemen heard, at sunrise, in a monument of granite situated near the centre of the spot on which the palace of Carnac stands, a sound resembling that of a *breaking string*, precisely the expression used by Pausanias in speaking of the Memnon statue. They regarded these sounds as arising from the transmission of rarefied air through the crevices of a sonorous stone.

From all the evidence collected it is now inferred that granitic rocks do emit sounds, when the external temperature is greatly different from that of the crevices in the granite; that the priests of Egypt, cognizant of the fact to a certain degree, caused the statue of Memnon to be sculptured from a block of granite which had been heard to emit such sounds; that the mouth of the statue was placed opposite to the sun to give an apparent but mystical connection between them; and that the simple sounds had been magnified in importance to suit the purposes of the priests.

The noises heard from sandy mountains, though probably different in their source, have been equally the objects of superstition and wonder. In that part of Arabia called Arabia Petræa, near the northern end of the Red Sea, is a mountain from which very singular sounds are heard. No European appears to have visited it before M. Seetzen, who wrote concerning it in 1812. He says:—"For two years I had heard it spoken of by the Greeks, first at the convent of Sinai, and afterwards at Suez; but the account which was given me of it was accompanied with so many fabulous recitals, that I was led to suppose it an invention of the merchants. When I obtained further information at Wady el Nachel, it not only confirmed these first accounts, but added to them new prodigies: such as that under the mountain there existed a Greek convent, and that the subterranean noise was that of the Nakous, or call to prayers. (The Nakous is a sort of long narrow rule, suspended in a horizontal position, which the priest strikes with a hammer, and the sound of which is heard at a distance.) It was also stated that a Greek, who had been dead for some time, had seen the mountain open, and had descended into the subterranean convent, where he found fine gardens and delicious water; and in order to give proof of this descent he had brought to the upper world some fragments of consecrated bread which he had received."

In order to see what had really given rise to these marvellous tales, Seetzen visited the mountain. He found it a bare but majestic rock of hard sandstone, inscribed with numerous names in the Greek, Arabic, and Koptic languages, which showed that it had often been visited. Upon two sides the mountain presented surfaces so inclined, that the white and slightly adhering sand by which it was covered could scarcely support itself, but slid down with the slightest motion, or even when the burning rays of the sun destroyed its cohesion. These two sandy declivities were about a hundred and fifty feet in height.

Seetzen first heard the sound shortly after noon. He climbed with great difficulty to a height of seventy or eighty feet, and stopped at a spot where the pilgrims were in the habit of placing themselves to listen. In climbing he heard the sound from beneath his knees, which made him think that the sliding of the sand was the cause, and not the effect, of the sounds. The sounds were heard at about one o'clock, then about three o'clock, and then a third time; and seemed to Seetzen to have great analogy to those of a humming-top, or sometimes to those of an Eolian harp. To test the truth of his conjecture that the motion of the sand was the cause of the sound, he climbed to the greatest height which he could reach, and slid down to the bottom as rapidly as he could, disturbing the sand at the same time with his hands and feet. The effect produced was so great, and the sand in rolling made so loud a noise, that the ground seemed to tremble, and Seetzen owns that he should have been afraid if he had not himself planned the experiment.

Mr. Gray, of Oxford, and Lieutenant Wellstead, have also described this sand-hill. The first time that Mr. Gray visited this place, he heard at the end of a quarter of an hour a low continuous murmuring sound beneath his feet, which gradually changed into pulsations as it became louder, so as to resemble the striking of a clock. In five minutes it became so strong as to detach the sand. He returned to the spot on the following day, and remained there an hour, during which he heard the sound much louder than on the preceding day.

Mr. Gray offers no solution of the cause of the sound, but M. Seetzen attributes it mainly to the motion of the particles of very dry sand over each other in descending. This seems to agree with the account given by Sir A. Burnes of a sand-hill in Afghanistan. It is situated in the vicinity of Cabul, and is called the Reg-Ruwan, or "moving-sand." Two ridges of hills, detached from the main line of the Hindu-Koosh, run in and meet each other; and at this spot is a hill, about four hundred feet high, and whose sides present an angle of about 40°, covered with a surface of very pure and dry sand. When this sand is set in motion by a body of people who slide down it, a sound is emitted. Sir A. Burnes says, "On the first trial we distinctly heard two loud hollow sounds, such as would be given by a large drum. On two subsequent attempts we heard nothing, so that perhaps the sound requires to be for a time settled before the curiosity is displayed. There is an echo in the place, and the inhabitants have a belief that the sounds are only heard on Friday, when the Saint of Reg-Ruwan, who is interred hard by, permits. The locality of the sand is remarkable, there being none other in the neighbourhood."

It seems scarcely susceptible of a doubt that the superficial stratum of sand is in both these cases the cause of the sounds; since the declivity is in both instances such as to allow the descent of the sand with a very slight impulse. The sound may result from the rolling of the particles of sand one over another; concentrated, it may be, by echoes from the neighbouring hills; for it would appear from the description that in both cases the sand-covered hill is adjacent to others which might return an echo.